

- (51) INT CL\*  
H04M 11/00
- (52) UK CL (Edition L)  
H4K KOF  
U1S S2106 S2107
- (56) Documents cited  
GB 2201065 A GB 2191066 A US 4540851 A
- (58) Field of search  
UK CL (Edition L) H4K KOE KOF  
INT CL\* H04M  
Online databases: WPL

- (57) A remote control device for controlling a VCR program reservation device 29 through the use of multiple digit codes entered via a remotely located pushbutton telephone 1. The multiple digit codes represent TV program reservation information. To ensure easy and accurate operation by the user, the device contains a microprocessor-controlled voice-synthesizer 7 which transmits voice-synthesized messages to the user consisting of instructions and confirmation data in response to each of the user's operations. The user activates the device, which also has a telephone answering function 8, by calling the device from the remote telephone. To select the TV program reservation function of the device, the user enters a security code. After the validity of the code is confirmed by the device, the user may then enter and review TV program reservations on the VCR program reservation device in accordance with the instructions and data provided by the voice-synthesizer. The device is reset when the remote telephone is placed on hook.

FIG. 1 is a block diagram of a speech synthesizing system. The system includes a keyboard (5) connected to a line monitoring circuit (6) and a voice synthesizing unit (7). The voice synthesizing unit (7) is connected to a tone decoder (8) and an echo recording unit (9). The tone decoder (8) outputs to a RAM (11) and a ROM (12). The echo recording unit (9) outputs to a RAM (11) and a ROM (12). The RAM (11) and ROM (12) are connected to a connector (25) which is linked to a VTR (35) via a relay (24). The system also includes a line monitoring circuit (6) and a keyboard (5).

FIG. 1

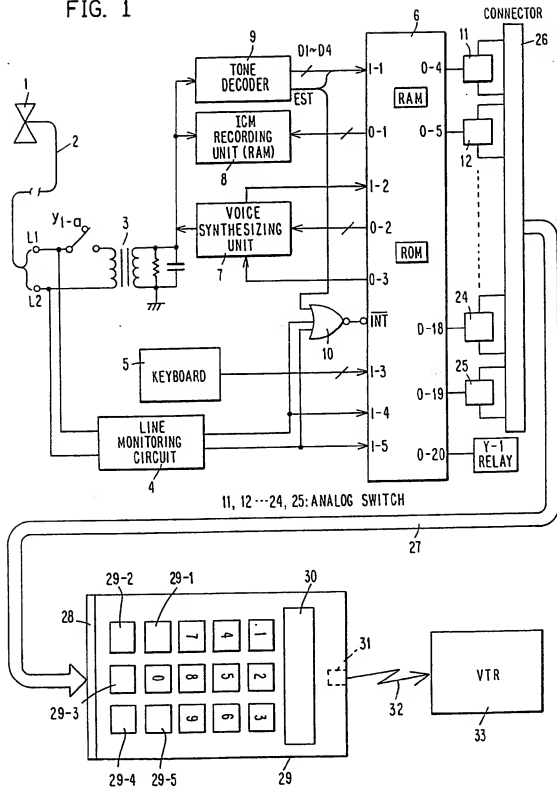


FIG. 2(a)

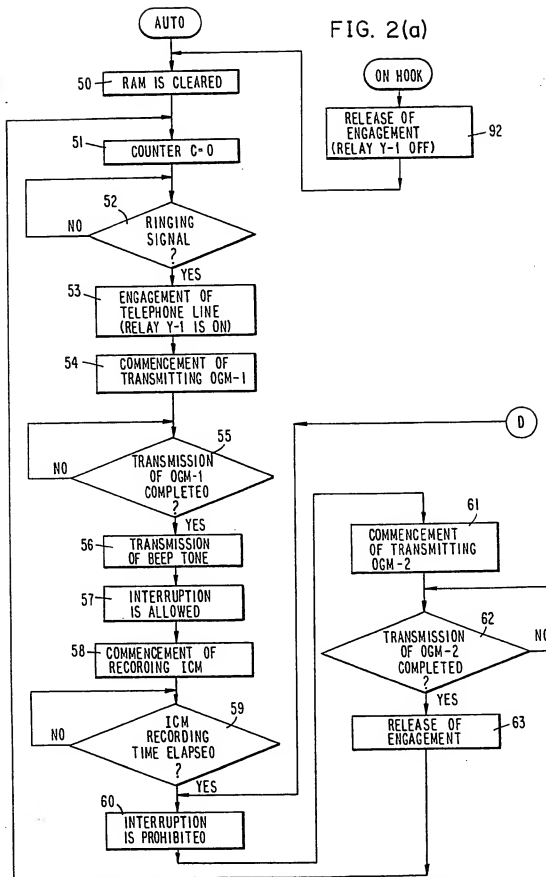


FIG. 2(b)

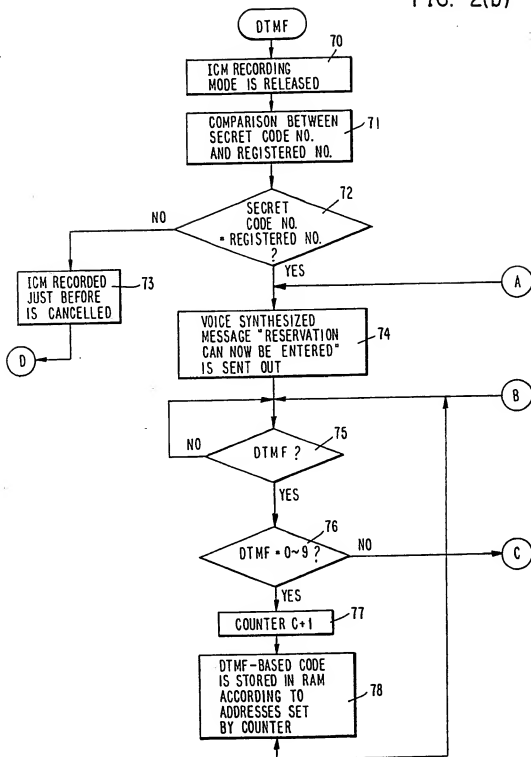
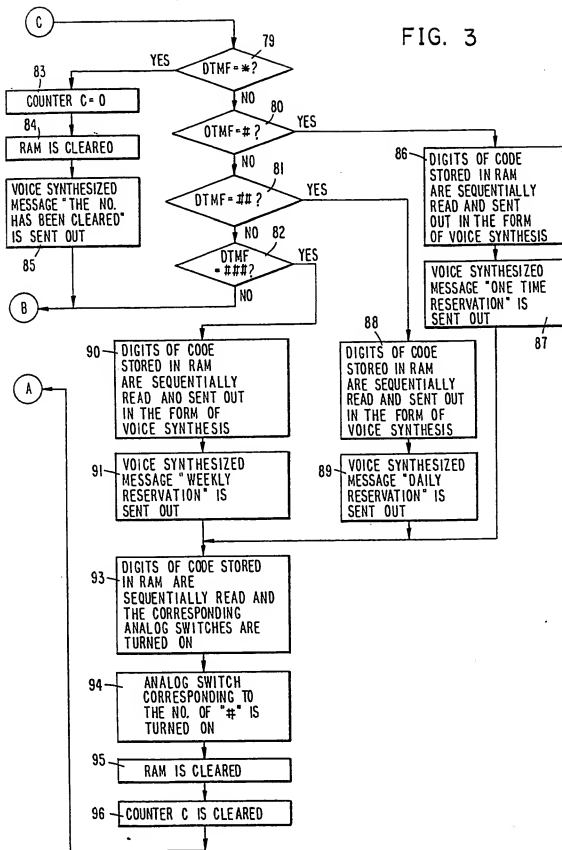


FIG. 3



AUTOMATIC CONTROL SYSTEM FOR VIDEO CASSETTE RECORDERBACKGROUND OF THE INVENTION

The present invention relates to a TV program reservation device for a video cassette recorder (VCR).

Heretofore, there have only been very complicated methods of entering a television viewing schedule in a VCR from a remote location. Therefore, the procedures have not been practical.

The present invention is directed to provide a means for simplifying the conventional methods so that general viewers may easily enter television viewing schedules in a VCR from a remote location.

SUMMARY OF THE INVENTION

A device capable of automatically controlling a VCR by storing, in the VCR, multiple-digit codes which represent TV programs listed in television guides or newspapers, has come into wide use among countries such as the United States of America. The present invention enables a general user to easily carry out the TV program reservation by controlling the device through an outside telephone while he/she is not at home.

The main operations to accomplish the above purpose are as follows:

5 the user calls his/her own device through the telephone line to confirm that the device is his/hers and inputs a multiple-digit code representing a desired TV program into the receiving section of the device through the telephone line, whereby the automatic control of the VCR subsequently takes place in accordance with the information represented by the code.

10

#### BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram illustrating an embodiment of the present invention.

15 Figs. 2 and 3 are a flowchart illustrating the operation of an embodiment of the present invention.

#### DESCRIPTION OF THE PREFERRED EMBODIMENTS

An embodiment of the present invention will be described subsequently with reference to its construction and operation.

20 Fig. 1 is a block diagram illustrating an embodiment of the present invention. In the diagram, numeral 1 refers to an unspecified outside telephone set, 2 to a telephone line and 3 to a line transformer. Numeral 4 refers to a line monitoring

circuit for detecting a ringing signal and detecting a voltage fluctuation of the telephone line at the time a caller places telephone set 1 on-hook after a telephone call. Numeral 5 refers to a keyboard having  
5 numeric keys for entering a secret code number and various keys for setting operation modes. Numeral 6 refers to one-chip microprocessor (CPU) containing a ROM for storing a computer program and a RAM for storing a code (described hereinafter) based on DTMF  
10 tones transmitted through the telephone line. Numeral 7 refers to a voice synthesizing unit for transmitting an outgoing message and some messages to respond to the caller's remote control operation by voice synthesis. Numeral 8 refers to an incoming message  
15 (ICM) recording unit comprised of a RAM for recording messages from calling parties. Numeral 9 refers to a tone decoder for decoding the DTMF tones transmitted through telephone line 2. Numeral 10 refers to a NOR gate connected to the interrupt terminal (INT) of CPU  
20 6. Numerals 11 to 25 refer to analog switches for short-circuiting various buttons of a remote control box described later. Numerals 26 and 28 to connectors, and 27 to a cable. As the alternative, however, connectors 26 and 28 can be directly  
25 connected without using cable 27.

Numeral 29 refers to the remote control box



having numbered buttons 0-9, "Cancel" button 29-1, "Weekly" button 29-2 used for weekly reservation, "Once" button 29-3 for a one-time recording, "Daily" button 29-4 for daily reservations, "Review" button 29-5 for confirmation of the stored data by means of display unit 30, and light emitting diode LED 31 which radiates infrared ray 32 when the reserved time has arrived. Numeral 33 refers to a video cassette recorder (VCR) controlled by the aforementioned infrared ray.

Next, the operation will be described concretely by reference to the flowchart shown in Figure 2. If the "Absent" key (not shown) of keyboard 5 is pressed, the program stored in the ROM of CPU 6 advances to Step 50 of the flowchart in Figure 2. At Step 50, the RAM is cleared in order to store the DTMF-based TV program reservation code to be transmitted by the caller. At Step 51, a counter (Counter C) which is built in CPU 6 is reset to "0." The counter counts the number of times DTMF tones are entered. Based on the count, the program selects addresses of the RAM for storing the DTMF-based TV program reservation code in the form of binary bits. At Step 52, the program waits for a ringing signal. When the program detects the ringing signal via line monitoring circuit 4 and input port I-4, Step 52 becomes affirmative. Then, at

Step 53, relay Y-1 connected to output port O-20 is maintained in ON condition. Accordingly, contact y1-a of relay Y-1 closes and the telephone line is engaged through line transformer 3, whereby incoming of the ringing signal is terminated and conversation can be started between telephone set 1 and the present device.

A first outgoing message OGM-1 in voice synthesizing unit 7 is then selected according to a command from output port O-2 (multiple bit), and transmission of this OGM-1 begins in response to a start signal from output port O-3 (Step 54). The program performs a test via input port I-2 to determine whether or not OGM-1 has completely been sent out. When the transmission of OGM-1 is completed, Step 55 becomes affirmative, and after a beep tone is transmitted from the voice synthesizing unit at Step 56, interruption is allowed at Step 57. Then recording of the caller's message (ICM) in ICM recording unit 8 is initiated in response to a start signal from output port O-3 at Step 58. When a predetermined recording time, for example, fifteen seconds has elapsed, Step 59 becomes affirmative and the above-mentioned interruption is prohibited at Step 60. At Steps 61 and 62, a second outgoing message OGM-2 (e.g. "Thank you very much") is then transmitted

from the voice synthesizing unit. At Step 63, the telephone line is disengaged by turning off relay Y-1. The program then returns to Step 52 via Step 51, so that the present device is restored to an original condition to wait for an incoming ringing signal.

The following is a description of the mechanism for carrying out reservation of TV programs via remote control box 29 from an outside telephone by the caller, the owner of the present device. First of all, outside telephone set 1 is used to call the present device, as stated above. Next, after the device is switched to a recording mode, the caller's message is recorded as occasion demands. Then transmission of the secret code number in the form of DTMF tones is commenced in response to operation of the keyboard of telephone set 1. The above DTMF tones are decoded by tone decoder 9 via line transformer 3. When the DTMF tones are identified by the tone decoder, an output generated at output terminal EST is transmitted to CPU 6 through NOR gate 10 for the purpose of interruption. Then the program branches to Step 70 and the ICM recording mode is released. At Step 71, a test, only roughly illustrated because it is well known, is undertaken to determine whether the registered number corresponds to the secret code number, for example, a three-digit number. If these

two numbers are not identical, the ICM recorded immediately before is cancelled at Step 73. The program then returns to Step 52 through Steps 60, 61, 62, 63 and 51, whereby the device is restored to the original waiting mode. If these two numbers are identical, a voice synthesized message "Reservation can now be entered" is sent out at the next Step 74. The program then waits for incoming DTMF tones representing a TV program reservation code at Step 75. As stated above, the presence of DTMF tones is determined if output is found, after testing, at the output terminal EST of tone decoder 9. If Step 75 becomes affirmative, a test is undertaken at Step 76 via input port I-1 to determine whether the DTMF tones, which came into tone decoder 9, represent the code comprising numbers of 0 to 9. Each TV program reservation code to be applied to the present device consists of 4 to 8 digits and is published in TV program guidebooks. For example, the number "77513" might represent the program on channel 4 beginning at 9:30 p.m. and ending at 10:00 p.m. on October 19, 1991.

If the DTMF tone representing the first digit comes into tone decoder 9, Step 76 becomes affirmative. The previously mentioned counter C is increased by 1 (Step 77). After the code based on the

above-mentioned DTMF tones is stored in the RAM according to the addresses set by the counter (Step 78), the program returns to Step 75. The second and subsequent DTMF-tone-based digits come into tone decoder 9 and are subsequently stored in the RAM  
5 addresses in accordance with the value in counter C as stated above.

First the caller transmits the prescribed number of digits representing a TV program reservation code in the form of DTMF tones. Then the pound key (#) of  
10 telephone set 1 should be pressed once if a one-time reservation of the TV program represented by the code is desired. If a daily reservation of the same TV program is desired, the pound key should be pressed  
15 twice. For a weekly reservation of the same TV program, the pound key should be pressed three times. The DTMF tone representing "#" is tested at Step 80, 81 or 82 via Steps 75, 76 and 79. When tone decoder 9 receives the tone one time, Step 80 becomes  
20 affirmative. Then the digits of the code stored in the RAM are sequentially read and sent out by voice synthesis at Step 86. In the case of the above example, a voice synthesized message "seven-seven-five-one-three" is sent out. At Step 87, a message  
25 "This is a one time reservation" is sent out by voice synthesis. When tone decoder 9 consecutively receives

the tone representing "#" two times, Step 81 becomes affirmative. After the digits of the code stored in the RAM are sequentially read and sent out by voice synthesis at Step 88, a voice synthesized message  
5 "This is a daily reservation" is sent out at Step 89. When tone decoder 9 receives the tone representing "#" three times in succession, the code in the RAM is similarly sent out by voice synthesis at Step 90, and then a voice synthesized message "This is a weekly  
10 reservation" is sent out at Step 91. More specifically, the program is such that not counter C but rather another counter memorizes the number of times the tone decoder receives the tone representing "#" and if the tone is not sent within a prescribed  
15 time interval (e.g., two seconds), the transmission of the tone is considered to be completed. If any mistake is made during the above operations, the caller may press the asterisk (\*) button. When the tone representing "\*" is received, Step 79 becomes  
20 affirmative. Then counter C is cleared (Step 83), the RAM is cleared (Step 84), and a voice synthesized message "The number has been cancelled" is sent out (Step 85). The program then returns to Step 75, so that the caller may carry out the operations for the  
25 purpose of re-input.

After the caller sends the tone representing "#"

one to three times in the above manner, the present device reads sequentially the digits of the code stored in the RAM by designating the addresses, turns on the corresponding analog switches (11-25), and  
5 inputs the code in remote control box 29 at Step 93. For example, if the digit of the code is "1," analog switch 12 is turned on, whereby the contact for button "1" of the remote control box is closed. Then, at Step 94, if the tone representing "#" has been sent  
10 one time, the contact for "Once" button 29-3 is closed. If the tone has been sent twice, the contact for "Daily" button 29-4 is closed. Similarly, if the tone has been sent three times, the contact for "Weekly" button 29-2 is closed. The operation of  
15 inputting the code in remote control box is now concluded. Then the above-mentioned RAM and counter C are cleared, respectively (Step 95 and Step 96), and the program returns to Step 74, at which the subsequent TV program reservation may be performed by  
20 repeating the above-mentioned operation if it is so required.

After finishing the above-mentioned operation for reservation, the caller places telephone set 1 on  
hook. At this time, the program branches to Step 92  
25 in response to an interruption via line monitoring circuit 4, and closing relay Y-1 is turned off so as

to disengage the telephone line. The program then returns to Step 52 via Steps 50 and 51, whereby the present device is restored to the waiting mode.

Although remote control box 29 is connected to the present device by means of the connectors, it is possible to incorporate the remote control box and the present device in one unit without using the connectors. In this case, the CPU (not shown), which is built in remote control box 29, is not used and its functions may be taken over by CPU 6 of the present device. If this is done, the caller can easily confirm the data by retrieving a plurality of previously entered TV program reservation codes one by one over the telephone line and listening to the data which is then announced by voice synthesis.

As described hereinbefore, the present device allows the general user to easily store television viewing schedules in his receiver not only at home, but also from outside the house through a telephone line, utilizing the VCR Plus+ system being widely used in the United States as it has greatly simplified the conventional method of TV program reservation in VCR required a rather intricate operation. Therefore, the present device has a large practical effect.



## CLAIMS:

1. An automatic control system for a video cassette recorder comprising:

5 circuit means for functioning as a telephone answering device and the like in response to a telephone's ringing signal;

means for controlling each operation button on the program reservation device of a video cassette recorder (VCR) in accordance with pressing of any of  
10 the ten keys on a telephone set from a remote location by the user during the operation of said circuit means;

means for responding by voice every time said each operation is completed; and

15 means for restoring the whole device to the original condition by setting the handset on-hook after said operation is confirmed.

2. An automatic control system for a video cassette recorder as set forth in claim 1, wherein  
20 said program reservation device is a VCR program reservation device (VCR Plus), which is widely used in the United States of America, or the like.

3. An automatic control system for a video cassette recorder as set forth in claim 1, wherein any

of the ten keys on a telephone set are to be successively pressed, for the purpose of controlling said program reservation device, according to a sequence of digits representing a previously selected TV program.

4. An automatic control system for a video cassette recorder (VCR) having a program reservation device, such as a "VCR Plus+" device, for automatically controlling program recordation by said VCR in response to a program code, comprising:

circuit means for performing functions of a telephone answering machine in response to an incoming ringing signal on a telephone line; and

control means for controlling program reservation functions of said program reservation device in response to program code signals received over the telephone line from a remote telephone terminal during operation of said circuit means.

5. The system of claim 4, including voice response means for responding over the telephone line verbally following each operation of said program reservation device, such as reception of a program code, over said telephone line.

6. The system of claim 5, including means for restoring said system to an initial state in response to placement of the remote telephone terminal in an on-hook state.

5        7. The system of claim 4, wherein said program code signals received by said control means are generated in response to operations of the keys of the remote telephone terminal.

10       8. The system of claim 4, wherein said control means includes means for sending control signals to said program reservation device via a wireless link.

15       9. The system of claim 4, wherein said program control means includes a voice synthesis unit, and means for controlling said voice synthesis unit to announce over the telephone line a plurality of program codes previously stored in said program control means.

20       10. A programmable apparatus for operating a broadcast recording device, the apparatus comprising means responsive to data received via an incoming telephone line for storing data representing a broadcast to be recorded, and means for operating the

recording device in accordance with the stored data.

11. A programmable apparatus as claimed in claim 10, wherein the data are represented by touch tones.

12. A system substantially as hereinbefore  
5 described with reference to the accompanying drawings.

13. Apparatus substantially as hereinbefore  
described with reference to the accompanying drawings.

**Patents Act 1977**  
**Examiner's report to the Comptroller under**  
**Section 17 (The Search Report)**

- 16 -

Application number

GB 9302120.2

**Relevant Technical fields**

(i) UK CI (Edition L ) H4K K0E, K0F

(ii) Int CI (Edition 5 ) H04M

**Databases (see over)**

(i) UK Patent Office

(ii) ONLINE DATABASE: WPI

**Search Examiner**

MR M. J. JONES

**Date of Search**

1 APRIL 1993

Documents considered relevant following a search in respect of claims 1-3, 12, 13

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB A 2201065 (LONG)	1
X	GB A 2191066 (HASHIMOTO)	1
X	US 4540851 (HASHIMOTO) see column 9 lines 8-12	1

Category	Identity of document and relevant passages	Relevant to claim(s)

#### Categories of documents

**X:** Document indicating lack of novelty or of inventive step.

**Y:** Document indicating lack of inventive step if combined with one or more other documents of the same category.

**A:** Document indicating technological background and/or state of the art.

**P:** Document published on or after the declared priority date but before the filing date of the present application.

**E:** Patent document published on or after, but with priority date earlier than, the filing date of the present application.

**&:** Member of the same patent family, corresponding document.

**Databases:** The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).